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AWARD NUMBER: W81XWH-08-2-0658

TITLE: Army Reserve Component Personalized Empowerment Program (ARCPEP)

PRINCIPAL INVESTIGATOR: LTC Georgia DeLaCruz, DMD

CONTRACTING ORGANIZATION: Henry M. Jackson Foundation for the
Advancement Military Medicine, Inc.
Rockville, MD 20852

REPORT DATE: October 2010

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

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13. SUPPLEMENTARY NOTES					
14. ABSTRACT Dental health significantly affects operational readiness of the Army Reserve Component (ARC). Dental Class III soldiers are considered non-deployable. Army regulations require that all soldiers have an annual dental examination and that 95% of soldiers are dentally ready (Class I or II). After deployment, soldiers must be dental Class I or II within 120 days. No effective mechanism exists to assess and track oral health and medical health issues related to unhealthy lifestyle behaviors of the ARC, much less to educate and motivate soldiers to improve their oral health especially as it relates to cardiovascular risk. Specific Aims: 1. Assess oral health and cardiovascular risk in a population of ARC soldiers and provide ARC soldiers with a Personal Empowerment Package (PEP) to motivate the adoption of healthy lifestyle choices, specifically to motivate soldiers regarding dental readiness. 2. Determine the ability of PEP to educate and motivate soldiers regarding dental readiness, increase healthy behaviors, and improve dental readiness. 3. Validate the utility of PEP to track medical and dental issues (including immunization record) in the ARC population. 4. Evaluate the feasibility of an Automated Personal Guidance System (APGS) to communicate with and motivate soldiers and educate soldiers regarding dental care. Relevance: Poor dental readiness is the leading cause of non-deployability for ARC soldiers. A PEP tool can help capture and track relevant oral and medical health issues and with coaching can educate, motivate, and assist soldiers to seek preventive care and improve force health with a comprehensive focus.					
15. SUBJECT TERMS None provided.					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 19	19a. NAME OF RESPONSIBLE PERSON USAMRMC
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U			19b. TELEPHONE NUMBER (include area code)

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Army Reserve Component Personalized Empowerment Program (ARCPEP)

Annual Report

September 2009 – September 2010

Introduction:

ARCPEP: The objectives of this study are to 1. Assess oral health and cardiovascular risk in a population of ARC soldiers and provide ARC soldiers with a personal empowerment program (PEP) to motivate the adoption of healthy lifestyle choices, specifically to motivate soldiers regarding dental readiness. 2. Determine the ability of PEP to educate and motivate soldiers regarding dental readiness, increase healthy behaviors, and improve dental readiness. 3. Validate the utility of PEP to track medical and dental issues (including immunization record) in the ARC population. 4. Evaluate the feasibility of an Automated Personal Guidance System (APGS) to communicate with and motivate soldiers.

Body

The accomplishments for this reporting period are as follows.

9/09/09	Protocol Review by CIC, modifications required.
10/29/09	Revised protocol submitted on IRBNet.
11/03/09	Modified CRADA resubmitted on IRBNet.
12/03/09	Dr. Vernalis met with MG T. Wright, Pennsylvania National Guard TAG and her Team at Fort Indiantown Gap, Pennsylvania. ARCPEP was briefed. Received approval from MG Wright to ask for volunteers to enroll in the ARCPEP protocol in a post deployment Stryker Brigade during reintegration drills starting March-June 2010.
12/30/09	All protocol modifications completed and submitted on IRBNet.
1/6-1/7/10	ARCPEP team met with VitalChart/IT developers
1/14/10	DCI forwarded protocol to MRMC and CIRO for second level review.
2/ 18/10	DCI sent protocol to MRMC and CIRO for second level review.
3/2/10	Protocol review by CIRO, modifications required
3/9/10	Final protocol approval from DCI
3/10/10	Participant enrollment began
3-5 /10	Health education content refined/ developed
3-5/10	Health coach training conducted including Military One Source
3/10	Created targeted education videos for Automated Personal Guidance System
4-5/10	Health Coaches developed workflow SOPs
3-6/10	ARCPEP team members traveled to Archibald, Dubois, Johnstown, Fort Indiantown Gap in Pennsylvania to recruit National Guard members. We have successfully enrolled 108 participants in the <i>Intervention</i> group and 155 in the <i>Control</i> group to date. We have completed web based baseline survey information on 263 participants. Dental classification has been identified from DenClass system for all enrollees to date and entered in the web based tool; available immunization records from eImmune can be viewed and printed on line by participants who have completed consents and surveys.

ARCPEP staff continued to provide the functional requirements of the novel web based tools. The staff also continued to communicate the vision and provide the list of the functionalities required for the project with the informatics subcontractor, VitalChart (VC). The response of the subcontractor has varied from immediate to slow. However, technical progress has continued in the three primary technical modules of the web based package of tools: a) participant b) coach and c) administrative/command.

ARCPEP: Report of Technical Development

Participant Web Site

- Refined the welcome/orientation sequence (intro video, surveys, and demographic information collection); admin can control, push to participants
- Participant can populate demographic and survey information

Coach Web Site

- Successful E-Immune Integration for real time vaccination reports. Coaches can view immunization records as can participants who have completed surveys.
- Coach can successfully pre populate demographic and survey information
- Coach can successfully communicate with participant via secure email

Admin Web Site

- Refine site/group metrics control for dashboard
- Refined bulk participant add w/ control-test sorting, email functionality, and coach assignment
- Created site content editor (enables admin to edit parts of the site)
- Created a tool for server application errors/ technical errors to be addressed by VC on a more immediate basis
- Created shorter email access link to ARCPEP site
- Created data analysis/query tool

Technical Obstacles:

The first three Beta tests for the Turn Key web based application failed with the inability to access the web site welcome sequence or participant page. The fourth Beta Test was successful and the ARCPEP executive team decided to proceed with enrollment as planned but causing 2 month delay. Subsequently, several participants from the enrollment group had difficulty accessing the web site. This seemed to be related to individual computers and was remedied with shorter email access links to initiate the welcome sequence to the web based tools.

In addition, the data query analysis tool did not meet our specifications and is currently being modified by VitalChart. A custom report feature is still not functional but being worked on.

BODY:

Significant accomplishments were achieved during this year. WRAMC DCI approval process was long but a major accomplishment. This protocol start was slower than expected because of the switch over to IRBNET and need for additional approvals from both National Guard Bureau and State National Guard. As a result, the start of the enrollment period was longer than anticipated.

From Jan to Jun 2010, the Army Reserve Component Personal Empowerment Program (ARCPEP) enrolled 263 soldiers from the Pennsylvania National Guard for participation. Written informed consent was obtained in every instance. The following is a summary of findings from self-reported information that can be categorized into demographical information, service related information, dental/oral health information, medical information, health survey results, health behaviors, health knowledge, and health resources.

Demographical Information. The PA National Guard soldiers were predominantly white men with an average age of 35 years. Ten per cent were officers, with 90% NCOs and enlisted soldiers. Officers were at least graduates of a bachelors program and nearly all NCOs and enlisted soldiers were high school graduates.

Service-related Information. Half of the soldiers had deployed once, but half had deployed more than once, most of these 2 or 3 times. Nearly all deployments were to Iraq.

Dental/Oral Health Information. Soldiers need significant improvement in their dental self-care habits, including brushing, flossing, using mouthwash, chewing xylitol gum and visits for teeth cleaning. Scores on the Dental Knowledge Test were disappointingly low with the mean score at 66%.

Medical Information. Medical problems were fairly uncommon (high cholesterol 16%, hypertension 11%, almost no diabetes) but overweight and obesity figures by BMI were alarmingly high. Only 17% of soldiers were normal weight, 48% were overweight, and 35% were obese. The potential future complications of this phenomenon are enormous.

Health Survey Results. These results revealed a number of important findings. In response to a single screening question for depression 53 (20%) indicated depression. This finding was substantiated with corroborating questions such as frequency of early awakenings which occurred at least 2 times per week in 55% of soldiers. Perceived stress levels were high with 50% of soldiers scoring at least mildly elevated stress levels and 15% scoring moderate to severe stress levels. Twenty six per cent of soldiers reported having difficulty dealing effectively with stress. Other health survey instruments revealed a major problem with sleep habits. There was high likelihood of sleep apnea in 40% of soldiers and poor sleep quality in 69%. Soldiers are having trouble getting to sleep, staying asleep, awakening early, having bad dreams, and suffer daytime consequences of insufficient sleep in the form of daytime sleepiness and fatigue.

Health Behaviors. Health behavior information showed that most soldiers get their blood pressure checked but too few have cholesterol and glucose checks according to recommended frequency. Very few can actually recall their actual measurements which reduces the degree of personal empowerment to take corrective actions when appropriate. Smoking is common among these soldiers (41%). Other health behaviors need improvement including dental self-care, exercise frequency, and healthful eating.

Health Knowledge. Few soldiers know their BP, cholesterol, or fasting glucose numbers. A minority (22%) of soldiers know about the Vaccine Health Network and re-immunization rates were high (50%) by soldier self-report.

Health Resources. Good news from these surveys is that few soldiers report problems with access to medical or dental care or insurance coverage.

Data analysis comparing soldiers according to certain categories revealed interesting findings:

1. Depressed soldiers were deployed less, scored worse on knowledge tests, and suffered from a number of sleep difficulties including too little sleep time, difficulty falling and staying asleep, greater daytime sleepiness and fatigue and greater use of sleep aids.
2. Officers were older, better educated and deployed more frequently. Officers slept more, smoked less and were more likely to eat healthfully. Officers reported less perceived stress, had better sleep quality and experienced less fatigue.
3. Compared to soldiers with single deployments, soldiers with multiple deployments were older, less likely to be depressed, had lower perceived stress levels, had better sleep quality and fewer bad dreams.
4. Soldiers screening positive for sleep apnea were far less healthy. These soldiers were older, fatter, and more likely to have high cholesterol and hypertension. These soldiers brushed their teeth less, smoked more, exercised less, and slept less. They also had higher perceived stress levels, poorer sleep quality, numerous other sleep issues, as well as daytime sleepiness and fatigue.
5. Overweight soldiers were much more likely to have high cholesterol and sleep apnea.

Key Research Accomplishments

Total subject enrollment (Intervention Group) 108

Total subject enrollment (Control Group) 155

Total subject enrollment 263

Health coach platform was very successful in assessing dental and other health behaviors

Successfully created Automated Personal Guidance Response System (APGS) connecting specific individual survey responses with targeted corresponding videoeducation

ARCPEP successfully identified significant oral health issues

ARCPEP successfully identified major health issues: depression, high stress levels, sleep issues and other unhealthy behaviors and provided a successful health coach platform

Adverse Events to date: None

Conclusion

The health coach platform was very successful in the assessment of dental and unhealth behaviors that augment cardiovascular risk.

Soldiers reported positively to our health coaches via telephonic contact. The coaches were able to provide PEP information and resource contacts and to gain the cooperation of the soldiers to appropriately assist them and target their needs. The coaches were successful in utilizing the ARCPEP technology tool for emailing, documentation, auto-populating demographics, sending recommendations, deployment of e-education, survey scoring and storage, and interfacing with e-Immune. The ARCPEP technology tool was properly linked with Military One-Source and E-Immune and provided resource links with education support. Furthermore the tool effectively provided a health snapshot, linking survey responses to the soldier's personal ARCPEP page. Soldiers frequently stated that they appreciated the personal outreach and that they felt cared for by the health coaches. A major success of the health coach platform was the identification of depressed soldiers and the provision of accessible outreach resources to these vulnerable soldiers.

The PA National Guard soldiers are spread out. Finding a virtual mode of "seeing" and helping soldiers is of critical importance. The ARCPEP experience to date suggests that the ARCPEP approach via the health coach platform is the right one.

A major point to stress is that ARCPEP provided an assessment mechanism that was successful and non-threatening. Soldiers could be evaluated for important dental issues, medical issues and behavioral choices in a non-stigmatizing atmosphere that encouraged honest responses. Soldiers with depression, high stress levels, and other emotional problems were identified and could thereby be contacted via secure e-messaging or telephonically to provide support. Current screening techniques may be inadequate for the identification of PTSD for which our survey data revealed much evidence.

Planned publications are underway and include abstracts and manuscripts that address: 1. Oral health and the Army National Guard, 2. Overall prevalence of health risks in the PA Army National Guard, 3. Utility of the non-stigmatizing approach to identify depression, 4. Prevalence and associated co-morbidities of stress in an Army National Guard population, and 5. Prevalence and co-morbidities of sleep issues in the Army National Guard.

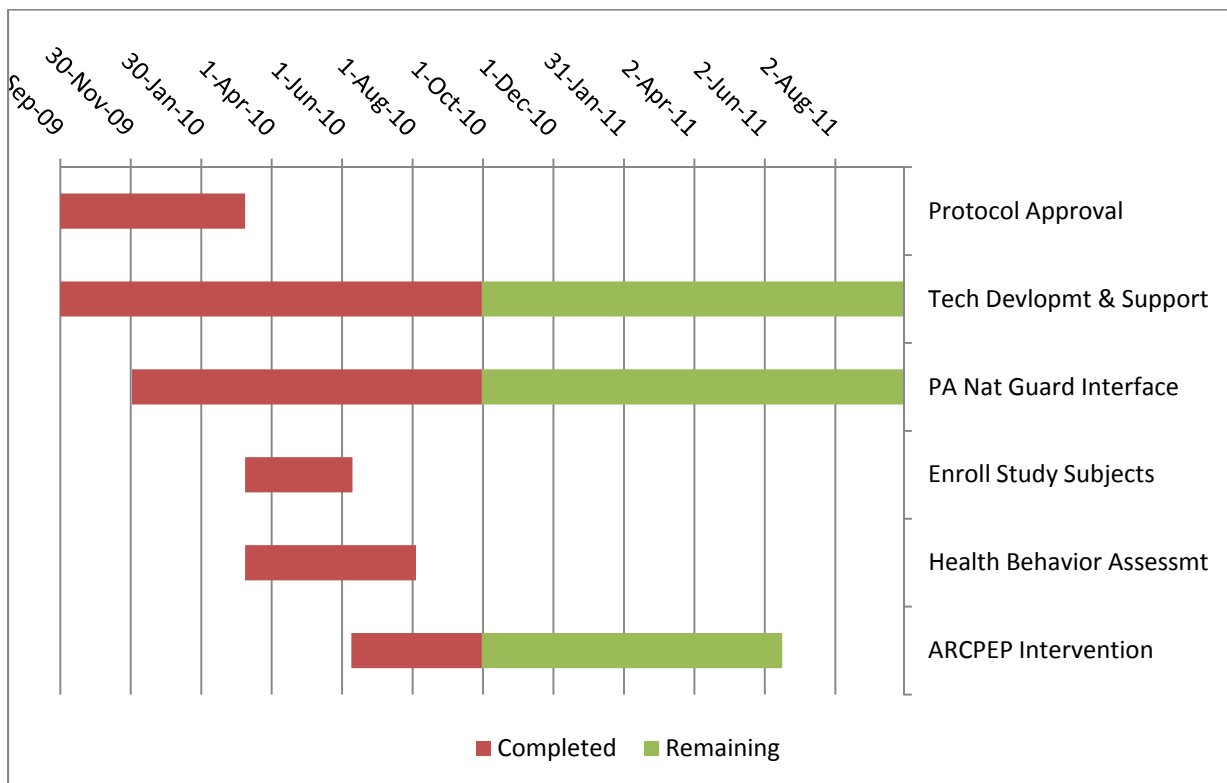
ARCPEP identified significant oral health issues with the PA NG . The active intervention tool to improve dental health is in progress and will be evaluated for participant response via email and online education. Further

data analysis will follow the completion of the intervention. Our early intervention experience so far suggests that Guardsmen are disinclined to go online to check email or seek health information and resources. This is in agreement with recently published reports^{1,2} and reflects experience of other telemedicine efforts in the DOD. According to COL Ron Poropatich, Deputy Director for the Telemedicine and Advanced Technology Research Center, “Many younger soldiers have moved beyond e-mail as their primary mode of communication. If you e-mail a young soldier, their inbox is usually full.” COL Poropatich goes on to quote young soldiers when they say, “Look, just text me, I don’t do e-mail.”

More sophisticated modes of communication to expand on the health coaching successes will be the focus of the ARCPEP continuation project. Plans for the ARCPEP continuation project will include development of an ARCPEP application into cell phone and/or tablet technology and stored with existing DOD applications such as the mCare warehouse. The application will continue to focus on oral and overall preventive health with special emphasis on modifying lifestyle behaviors to reduce cardiovascular disease and diabetes.

Appendices

See Attachments A, B , C.



ATTACHMENT A



DEPARTMENT OF THE ARMY
WALTER REED ARMY MEDICAL CENTER
WALTER REED HEALTH CARE SYSTEM
WASHINGTON, DC 20307-5001

REPLY TO
ATTENTION OF

DATE: August 19, 2010

TO: LTC Georgia Dela Cruz, DC, USA

FROM: MAJ Jessica Zaret, MC, Chief, Research Review Service

SUBJECT: IRBNet ID: [350270-8] and Work Unit # 09-7206 - Continuing Review

COMMITTEE APPROVAL DATE: August 10, 2010

REVIEW TYPE: Full Committee Review

STUDY TITLE: ARCPEP--Army Reserve Component Personal Empowerment Program

Dear Dr. Dela Cruz,

1. The continuing review report for this protocol was reviewed and approved in accordance with Federal Human Subject Protection Requirements for continuation for one year. This study is open for accrual. The updated stamped Informed Consent Form(s) (ICFs) should be used for future enrollment and are available in IRBNet under Reviews.
2. The approval of this continuing review expires on September 8, 2011. You will receive automatic reminder notices when the next continuing review is due.
3. POC for this action is Angela Quispe, Continuing Review, (202) 782-7833.

Chief, Research Review Service
Department of Clinical Investigation

"Electronic Signature Notice: In accordance with the "Government Paperwork Elimination Act" (GPEA) (Pub.L. 105-277; codified at 44 USC 3504); Federal and DOD applicable instructions, directives and regulations, documents have been electronically signed and authorized by all who have been required to do so. These signatures have the same effect as their paper-based counterparts. Verification is retained within our protected electronic records and audit trails."

ATTACHMENT B

9/2/2010 1:03 PM

Quispe, Angela C Mrs CIV USA MEDCOM WRAMC

From: Sarathy, Komanduri P Dr CIV USA MEDCOM WRAMC
Sent: Wednesday, September 01, 2010 11:45 AM
To: Quispe, Angela C Mrs CIV USA MEDCOM WRAMC
Subject: FW: A-14975, Continuing Review Acceptance Memorandum (Proposal Log Number 08016001, Award Number W81XWH-08-2-0658) (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Fyi....thanks

-----Original Message-----

From: Odam, Kimberly L Ms CIV USA MEDCOM USAMRMC
Sent: Wednesday, September 01, 2010 11:44 AM
To: Dela Cruz, Georgia G LTC MIL USA MEDCOM OTSG
Cc: USAMRMC CLINICAL INVESTIGATION REGULATORY OFFICE; Duchesneau, Caryn L Ms CIV USA MEDCOM USAMRMC; Brosch, Laura R Dr CIV USA MEDCOM USAMRMC; 'ospnga@hjf.org'; 'ssrinagesh@hjf.org'; 'Marianne Spevak'; 'Stanley, Amber Ms IPA'; Wells, Lisa L Ms CIV USA MEDCOM USAMRAA; Moore, Celine A CTR US USA; Bennett, Jodi H Ms CIV USA MEDCOM USAMRMC; Neath, Denise N Ms CIV USA MEDCOM WRAMC; Green, Marty I Ms CIV USA MEDCOM WRAMC; Beaner, Diane M Ms CTR USA MEDCOM WRAMC; Parchment, Verna A Ms CIV USA MEDCOM WRAMC; Kessler, Deborah D Ms CIV USA MEDCOM WRAMC; Zaret, Jessica H MAJ MIL USA MEDCOM WRAMC; Babcock, Janiine COL MIL USA MEDCOM WRAMC; Sarathy, Komanduri P Dr CIV USA MEDCOM WRAMC; Moore, Celine A CTR US USA; Barretto-Jones, Pamela Ms CTR US USA MEDCOM USAMRMC; 'Stephenson, Jeffrey Dr IBA'; Katopol, Kristen R Ms CTR US USA MEDCOM USAMRMC; Odam, Kimberly L Ms CIV USA MEDCOM USAMRMC
Subject: A-14975, Continuing Review Acceptance Memorandum (Proposal Log Number 08016001, Award Number W81XWH-08-2-0658) (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

SUBJECT: Continuing Review Acceptance for the Protocol, "ARCPEP Project - Army Reserve Component Personal Empowerment Program," Submitted by LTC Georgia G. Dela Cruz, DC, Office of the Surgeon General (OTSG), Dental Affairs, Leesburg Pike, Virginia, Proposal Log Number 08016001, Award Number W81XWH-08-2-0658, IRBNet 350270, HRPO Log Number A-14975

1. The U.S. Army Medical Research and Materiel Command (USAMRMC), Office of Research Protections (ORP), Human Research Protection Office (HRPO) approved the subject protocol on 9 March 2010.
2. The HRPO received a continuing review report for the subject protocol on 24 August 2010. The Walter Reed Army Medical Center Research Review Service approved continuation of the protocol on 10 August 2010; this approval will expire on 8 September 2011.
3. The submitted continuing review report and supporting documentation have been reviewed by the HRPO and found to be in compliance with Federal, DOD, and U.S. Army human subjects protection requirements. The report and supporting documents are accepted.
4. This study is currently approved for the enrollment of approximately 12 unit Commanders from each unit and up to 600 (300 per unit) Army Reserve/National Guard soldiers subjects. To date, 399 Pennsylvania National Guardsmen have been enrolled in the study - 255 in the intervention arm and 144 in the control arm.

ATTACHMENT C DATA SUMMARY

DEMOGRAPHICAL INFORMATION

Age

35 ± 9.1, range 20-59 years

Gender

Male 236 (90%)

Race

White 245 (93%)

Black 7 (3%)

Latino 5 (2%)

Asian 2 (1%)

Not Specified 4 (2%)

Rank

O5	1	E9	3
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O4	4	E8	10
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O3	8	E7	6
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O2	6	E6	53
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W4	4	E5	78
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W3	1	E4	77
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W2	1	E3	0
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E2			1
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Sum	25		228
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Education

No High School 2 (<1%)

High School 163 (62%)

Associate of Arts 50 (5%)

Bachelors 33 (13%)

Post Graduate 14 (5%)

NS 3 (1%)

Marital Status

78 Unmarried (30%)

152 Married (58%)

5 Separated (2%)

26 Divorced (10%)

2 NS (1%)

SERVICE INFORMATION

Deployment Location 2008-09

248	Iraq (94%)
10	NS (4%)
1	FIG
1	Ft Dix
1	Kos
1	Kuw
1	PA

Number of Tours

1 Tour	132 (50%)
2	90 (34%)
3	26 (10%)
4	4 (2%)
NS	11 (4%)

DENTAL/ORAL HEALTH INFORMATION

Brush Teeth (Times per day)

0 times	3 (1%)
1	94 (36%)
2	146 (56%)
3	20 (8%)

Floss Teeth (Times per day)

0 times	(45%)
1	(50%)
2	(0%)
3	(5%)

Use Mouthwash (Times per day)

0 times	(40%)
1	(55%)
2	(5%)

Chew Xylitol Gum

Yes	(5%)
No	(95%)

Teeth Cleaning in Last 12 Months

Yes	(65%)
No	(34%)

MEDICAL INFORMATION

History of High Blood Pressure

Yes 30 (11%)
No 229 (87%)
NA 4 (2%)

History of High Cholesterol

Yes 41 (16%)
No 210 (80%)
NA 4 (2%)

History of Diabetes

Yes 2 (1%)
No 261 (99%)

Body Mass Index (kg/m²)

Mean 28.4 + 4.3, range 19 to 48

Normal (< 25) 46 (17%)
Overweight (25 to 29) 126 (48%)
Obese (30 to 34) 70 (27%)
Very Obese (35 to 39) 15 (6%)
Very Severely Obese (≥ 40) 5 (2%)

HEALTH SURVEY INFORMATION

Standardized Depression Question

Depressed Yes 53 (20%)
Depressed No 210 (80%)

Times per Week with Early Awakenings

0 47 (18%)
1 61 (23%)
2 72 (27%)
3 74 (28%)
NA 8 (3%)

Perceived Stress Scale (0 to 56)

Mean 22.2 + 8.1, range 0 to 48

Less than average (0 to 22) 131 (50%)
Mild increase (23 to 30) 89 (34%)
Mod increase (31 to 40) 34 (13%)
Severe increase (41 to 48) 5 (2%)
NA 4 (2%)

Effectively Dealing with Stress

Often 5 73 (28%)
4 46 (17%)
3 74 (28%)
2 37 (14%)
Rarely 1 32 (12%)

Berlin Questionnaire for Sleep Apnea

Positive for Sleep Apnea	106 (40%)
Negative for Sleep Apnea	152 (58%)
NA	5 (2%)

Pittsburgh Sleep Quality Index (0 to 21)

Mean 7.3 ± 4.0 , range 0 to 21

Normal score (< than 5)	73 (28%)
Mild abnormality (5 to 9)	110 (42%)
Mod abnormality (10 to 14)	59 (22%)
Severe abnormality (≥ 15)	13 (5%)
NA	8 (3%)

Sleep Quality by Self Report (Past Month)

Very Good	44 (16%)
Fairly Good	129 (49%)
Fairly Bad	66 (25%)
NA	8 (3%)

Epworth Sleepiness Scale (0 to 24)

Mean 8.2 ± 4.8 , range 0 to 24

Not sleepy (< 10)	174 (66%)
Mildly sleepy (11 to 14)	55 (21%)
Mod sleepy (15 to 19)	19 (7%)
Severely sleepy (20 to 24)	8 (3%)
NA	7 (3%)

Fatigue Scale (0 to 10)

Mean 4.2 ± 2.2 , range 0 to 10

Not fatigued (< 4)	99 (38%)
Mild fatigue (5 to 6)	97 (37%)
Mod fatigue (7 to 8)	46 (17%)
Severe fatigue (9 to 10)	5 (2%)
NA	6 (2%)

HEALTH BEHAVIORS

Blood Pressure Check in Last Year

Yes 235 (89%)
No 26 (10%)
NA 2 (1%)

Cholesterol Check in Last Year

Yes 167 (63%)
No 95 (36%)
NA 1 (<1%)

Glucose Check in Last Year

Yes 91 (35%)
No 169 (64%)
NA 3 (1%)

Smoke Cigarettes

107 (41%) smoke
156 (59%) do not smoke

Servings of Fruits/Vegetables (per day)

1 88 (30%)
2 85 (32%)
3 53 (20%)
4 26 (10%)
5 1 1 (42%)
6 1 (<1%)
7 2 (1%)

Servings of Meat (per week)

1 166 (63%)
2 75 (29%)
3 22 (8%)

Mediterranean Diet Score (X/14)

Mean 4.6 ± 2.2 , range 0 to 14
Lowest Third (0 to 4) 129 (49%)
Middle Third (5 to 10) 122 (46%)
Highest Third (11 to 14) 6 (2%)
NA 6 (2%)

Times per Week at least 7 hrs sleep

0 times per wk 89 (34%)
<3 104 (40%)
3 to 5 67 (25%)
> 5 2 (1%)

Hrs of Sleep per Night by Self Report

Mean 6.2 ± 1.3 hrs, range 2 to 9.5 hrs
< minimum recommended 7 hrs/night = 160 (61%)

Sleep Efficiency (Time Asleep / Time in Bed; normal $\geq 70\%$)

Mean $84.2 \pm 14.4\%$, range 30 to 100%

Abnormal 99 (38%)

NA 9 (3%)

Sleep Latency (Time to Fall Asleep; normal ≤ 25 min)

Mean 26.4 ± 27.3 min, range 1 to 210 min

Abnormal 95 (38%)

NA 9 (3%)

Times per Week > 30 min to sleep

0 88 (33%)

1 61 (23%)

2 52 (20%)

3 51 (19%)

NA 10 (4%)

Times per Week Awakened by Bad Dreams

None 146 (55%)

< 1 57 (22%)

1 or 2 38 (14%)

≥ 3 18 (7%)

NA 9 (3%)

Times per Month Used Sleep Aids

Not in past month 194 (73%)

Less than once/wk 21 (18%)

Once or Twice/wk 12 (5%)

Three or More/wk 28 (11%)

NS 8 (3%)

HEALTH KNOWLEDGE**Know BP Reading?**

Yes 95 (36%)

No 168 (64%)

Know Total Cholesterol Number?

Yes 23 (9%)

No 240 (91%)

Know Glucose Number?

Yes 12 (5%)

No 251 (95%)

Score on Dental Knowledge Test (18 points = 100%)

Mean 12.1 ± 2.0 , range 6-18

Scored less than 12 points (< mean or 66%) = 91 (35%)

Familiar with Vaccine Health Network?

Yes	57 (22%)
No	202 (77%)
NA	4 (2%)

Repeat Vaccinations?

No	101 (38%)
Yes	131 (50%)
Don't Know	27 (10%)
NA	4 (2%)

HEALTH RESOURCES**Do You Have a Primary Care Provider?**

No PCP	1 (<1%)
PCP from VA	15 (6%)
PCP from Tricare	2 (1%)
PCP from FIG, DOD, PANG	7 (3%)
PCP private	4 (2%)
Na	4 (2%)

Do You Have Insurance?

No Insurance	0 (0%)
VA	16 (6%)
Tricare	2 (1%)
FIG, DOD, PANG	7 (3%)
Private	4 (2%)
NA	4 (2%)

Do You Have a Dentist?

No Dentist	0 (0%)
VA	16 (6%)
Tricare	2 (1%)
FIG, DOD, PANG	7 (7%)
Private	4 (2%)
NA	4 (2%)

DEPRESSION STATISTICS as of 9/29/10

53	Answered "yes" on Depression Screening Question of Health Survey
37	Received Certified Letter after being called three times and three emails
7	Already in counseling when we spoke to them
2	Initiated counseling after talking with ARCPEP Health Coach
1	Initiated counseling after receiving Certified Letter
7	Did not feel they required counseling assistance at this time
1	Did not want to be contacted by phone or email or USPS mail

DATA ANALYSIS

Comparison by Depression

53 soldiers screening positive for depression were compared with 210 screening negative for depression.

The depressed group had fewer deployments on average (1.4 vs 1.7, $p = 0.02$).

Regarding Health Knowledge, the depressed group scored lower on the dental knowledge test, specifically below the mean, compared to the non-depressed group who scored slightly above the mean, $p = 0.03$.

Other differences appeared on Health Survey questions. The depressed group experienced much higher stress on the Perceived Stress Scale (PSS 29.6 vs 20.3, $p < 0.001$); and reported more frequent difficulty finding enthusiasm (1 or 2 times per week vs less than once per week, $p < 0.001$). Sleep quality was worse in the depressed group with self-reported sleep quality 1.7 vs 1.1, $p < 0.001$ and Pittsburgh Sleep Quality Index (PSQI) 10.6 (moderately disturbed) vs 6.5 (mildly disturbed), $p < 0.001$. The depressed group had more daytime sleepiness (Epworth Sleepiness Score 10.2 vs a normal score of 6.5, $p < 0.001$); and more fatigue 5.5 (moderate fatigue) vs 3.8 (no fatigue) $p < 0.001$. The depressed group reported less total sleep time (5.7 vs 6.3 hrs, $p = 0.001$); longer sleep latency (42.8 vs 22.2 min, $p < 0.001$); poorer sleep efficiency (75.3 vs 86.3%, $p < 0.001$); more early awakenings (2.2 vs 1.5, $p < 0.001$); greater use of sleep aids, $p < 0.001$; and more frequent bad dreams (1.3 vs 0.5, $p < 0.001$).

Comparison by Rank

25 officers were compared with 228 non-commissioned officers (NCOs) and enlisted soldiers. Officer ranks ranged from W2 to O5. NCO and enlisted ranged from E2 to E9.

Officers were older (40.5 vs 34.4 yrs, $p = 0.001$); better educated (Bachelors degree or more vs high school or Associates degree, $p < 0.001$); and had more deployments on average (2.0 vs 1.6, $p = 0.02$).

Health Behaviors were better in the officer group. Officers slept somewhat more (1.3 vs 0.9 nights per week with at least 7 hours sleep, $p = 0.05$); less frequently smoked (12 vs 44%, $p = 0.002$); were more likely to get fasting glucose checked (60 vs 47%, $p = 0.006$); and were more likely to follow a Mediterranean Diet (5.8 vs 4.5 points, $p = 0.005$).

Health Surveys revealed that officers experienced less stress (PSS 17.8 vs 22.6, $p = 0.004$); had better sleep quality (PSQI 5.56 vs 7.49, $p = 0.02$); got more sleep on average (6.7 vs 6.1 hrs, $p = 0.03$); and felt less fatigued (3.2 vs 4.3, $p = 0.02$). Officers did however awaken to urinate more frequently (1.8 vs 1.1 times per night, $p = 0.001$).

Comparison by Number of Deployments

120 soldiers who had more than one deployment (range 2 to 4) were compared with 132 soldiers who had experienced only one deployment.

Soldiers with multiple deployments were somewhat older (37.3 vs 33.1 yrs, $p < 0.001$); and were less likely to be depressed (13 vs 27, $p = 0.006$).

Health Surveys revealed that soldiers with multiple deployments experienced less stress (PSS 20.6 vs 23.6, $p = 0.003$); had better sleep quality (PSQI 6.7 vs 7.9, $p = 0.02$); shorter sleep latency (22.1 vs 30.0 min, $p = 0.03$); and had fewer nights with bad dreams (0.54 vs 0.79, $p = 0.04$).

Comparison by Health Survey Results for Sleep Apnea (Berlin Questionnaire)

105 soldiers scored highly likely to have sleep apnea. These soldiers were compared with 153 soldiers who screened negative for sleep apnea.

Solders with sleep apnea were slightly older (36.9 vs 33.8 years, $p = 0.008$), and had higher body mass index (BMI 30.1 vs 27.3, $p < 0.001$).

Solders with sleep apnea were more likely to have hypertension (24 vs 4%, $p < 0.001$); and more likely to have high cholesterol (25 vs 11%, $p = 0.006$).

Health Behaviors were worse in soldiers with sleep apnea. These soldiers brushed their teeth less often on average (1.5 vs 1.8 times per day, $p < 0.001$); exercised less (2.3 vs 2.9 times per week, $p = 0.01$); slept at least 7 hrs less often (0.8 vs 1.0 times per week, $p = 0.04$); and were more likely to smoke (48 vs 35%, $p = 0.04$).

Health Surveys revealed numerous problems in soldiers with sleep apnea. These soldiers experienced greater stress levels (PSS 23.3 vs 21.3 $p = 0.05$); poorer self-reported sleep quality (1.46 vs 1.04, $p < 0.001$); poorer PSQI (8.6 vs 6.4, $p < 0.001$); greater daytime sleepiness (ESS 9.8 vs 7.1, $p < 0.001$); greater fatigue (4.9 vs 3.7, $p < 0.001$); less total sleep time (5.8 vs 6.5 hrs per night, $p < 0.001$); poorer sleep efficiency (81 vs 87%, $p = 0.001$); more early awakenings (1.9 vs 1.6 per night, $p = 0.05$); and more difficulty finding enthusiasm (1.1 vs 0.79, $p = 0.003$).

Comparison by Body Mass Index (BMI)

46 soldiers of normal BMI were compared with 216 soldiers who were overweight or obese by BMI criteria. The main differences between these groups were that the soldiers with high BMI more frequently had high cholesterol (19% vs 4%, $p = 0.01$) and sleep apnea (44% vs 27 %, $p = 0.04$).

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